Nick Tymchenko
US EPA Region 3

215-814-2022
tymchenko.nick@epa.gov

Update of Area Wide Optimization Program (AWOP) activities in US EPA Region 3

National AWOP activities

An AWOP is a multi-state effort in which states work together to develop and implement individual state programs to optimize particle removal and disinfection capabilities of conventional surface water treatment plants in each respective state. AWOP is designed to provide state drinking water staff tools to assist water systems to work toward optimizing their existing treatment processes in an effort to increase public health protection. It also helps prioritize state resources by identifying systems that would benefit the most from assistance. While originally developed to address microbial contaminants, AWOP has expanded beyond the original tools and is an ever-changing and ever-growing program that now addresses both microbial contaminants and disinfection byproducts (DBP) at surface water Public Water Systems (PWS). Initial steps are also being taken to investigate how to extend the optimization concept to ground water systems and distribution systems.

US EPA Regions 3, 4, 6, and 10, along with staff of EPA HQ and the EPA Technical Support Center (TSC), are currently coordinating AWOP activities for 21 states. In addition to turbidity optimization, the EPA TSC is developing a DBP optimization status component. A status component is the state specific prioritization criteria of its systems to assess relative risk. A comprehensive performance evaluation (CPE) for DBP control in the treatment plant has been developed and a water quality control strategy for the distribution system is also under development. Control strategies under evaluation consist of distribution system water age and turnover control in storage tanks. The TSC is also evaluating the relationship between consecutive systems and their sources in order to further control DBP development.

Arkansas has created a status component for ground water (GW) systems. Arkansas drinking water staff have compiled data from different sources within their state databases in the development of the status component. This has assisted them to focus on those ground water systems which may pose a greater risk to public health due to microbial contamination.

Region 3 AWOP activities

Within EPA Region 3, MD, PA, VA, and WV voluntarily participate in AWOP. DE does not due to its limited inventory of three surface water PWSs. Quarterly meetings have been held since 2003 with meeting locations rotating throughout the Region. Each state tailors their respective optimization program in a way that best meets their needs; however, it is based on the AWOP model of Status Component, Targeted Performance Improvement Component, and the Maintenance Component. The ultimate goal of AWOP is achieving optimized performance of existing facilities at surface water treatment plants by maximizing a state's limited resources to best protect public health. Optimization is discussed in terms of treated water turbidities as optimized particle removal corresponds directly to increased pathogen removal. When plant filters are operated at or near optimal conditions (0.1 NTU, 95% of the time), they can achieve in the vicinity of 3-logs (or more) removal of the protozoa *Cryptosporidium.*

Each quarterly meeting state host is encouraged to invite their State Director to attend the first portion of the quarterly meeting, which is the state feedback portion, to be briefed on their respective state's overall progress as well as to see what approaches other states have taken.

Nick Tymchenko
US EPA Region 3

215-814-2022
tymchenko.nick@epa.gov

In July 2006, the Region 3 AWOP began a series of Performance Based Training (PBT) sessions for operators from five PWSs. Plants from PA, MD, WV, and VA are represented. PBT, one of the AWOP tools, is a 15-month long program that teaches plant operators leadership skills and problem solving techniques to assist them in optimizing plant performance. MD, PA, VA, and WV drinking water program staff serve as facilitators to each of these plants. The facilitators work with the systems between PBT sessions (5 in all) by providing advice and coaching to ensure the operators complete their assignments prior to the next session. An AWOP quarterly meeting was held in July in conjunction with the PBT and was also attended by representatives from the Penn State Technical Assistance Center (TAC) and the Walkerton Clean Water Centre (an Agency of the Government of Ontario, Canada).

The next PBT session, #2, will focus on utilizing special studies to optimize water treatment plant unit process performance and will be held at the Chehalis water treatment plant (WTP), in Hagerstown, MD. Studies such as evaluation of actual chemical feed pump dose versus calculated plant dose and impact of backwash on other operating filters will be conducted so that the operators learn valuable problem solving skills and prepare them for a homework assignment in which they identify a special study for their own plant and conduct it before the next meeting. Each PBT kicks off with plant operators presenting results of homework from the previous PBT. Jar testing, as a process control tool will be the focus of PBT #3.

The foundation for assessing the impact of PBT is Optimization Assessment Software (OAS). OAS is an MS Excel spreadsheet which tracks a WTP's raw water, sedimentation basin effluent, and combined filter effluent monthly turbidity data and produces 12-month trend graphs and summaries on turbidity. It is a powerful tool that allows operators and facilitators to track progress toward optimization goals.

Upcoming Region 3 AWOP events

October 17-18, 2006	Region 3 AWOP Planning Meeting and PBT Session 2 Training – Hagerstown, MD
January 9-10, 2007	Region 3 AWOP Planning Meeting and PBT Session 3 Training – Winchester, VA
April, 2007	Region 3 AWOP Planning Meeting and PBT Session 4
July 31 – August 2, 2007	Second National AWOP Meeting in Cincinnati, OH
July 2007	Region 3 AWOP Planning Meeting and PBT Session 5

Each Region 3 state is providing continuing education units (CEUs) to the operators who are participating in the PBT sessions. During the quarterly meeting, the Penn State University Technical Assistance Center (TAC) provided information on how it will be able to assist in streamlining CEU approval through reciprocity agreements with other state universities.

As discussed earlier, Region 3 states tailor their optimization program to meet their needs. Each state's status component is based on criteria that provide the most value for staff to prioritize the states surface water plants.

Nick Tymchenko
US EPA Region 3

215-814-2022
tymchenko.nick@epa.gov

Maryland Department of the Environment (MDE)

AWOP Goals: MDE continues its participation with AWOP. Their status component is used to assist in determining future CPE needs of its 52 filter plants
Successes: OAS results are shared with each system during sanitary surveys and/or CPEs. MDE provided a detailed annual 2005 AWOP report. MDE staff are coordinating for two PWS's attendance at PBT – *Frederick City and Hagerstown*

Pennsylvania Department of Environmental Protection (PA DEP)

AWOP Goals: PA DEP is considering implementing PBT state wide upon completion of the current multi-state PBT. AWOP is implemented through Central Office. PA DEP will be coordinating with the Penn State TAC in the development of future PBTs and PA DEP is also considering attending EPA Region 4's AWOP quarterly meeting to observe its DBP optimization activities within the distribution system. Region 4 is several years ahead of Region 3 in the AWOP implementation.
Successes: PA DEP has teamed up with 277 of the Commonwealth's surface water treatment plants to assess their performance with OAS. Results of OAS inputs are shared annually with each PWS. PA DEP provided a detailed annual 2005 AWOP report. PA DEP staff are coordinating for a PWS attendance at PBT – *Chambersburg, PA.*

Virginia Department of Health (VDH)
AWOP Goals: VDH's program focuses on plant optimization, the status component is not used to prioritize or allocate VA resources. The program is implemented through district offices.
Successes: Setting up an awards program for systems based on meeting optimization goals. VDH provided a detailed annual 2005 AWOP report. VDH staff are coordinating for a PWS attendance at PBT – *City of Winchester*

West Virginia Department of Health (WVDHHR)
AWOP Goals: WV is also considering implementing PBT, state wide, upon completion of the current multi-state PBT.
Successes: WV intends to provide CEUs for plant operators who display proficiency with OAS. WVDHHR provided a detailed annual 2005 AWOP report. WV shares status component rankings with individual systems. WVDHHR staff are coordinating for a PWS attendance at PBT – *Charles Town*

Some items to discuss at the State Director's meeting:

- Positive response to AWOP with attendance at every meeting. Need to continue to send two staff members to each meeting.
- Opportunities for "tie-in" to Capacity Development and DWSRF programs
- Kudos for each State's AWOP annual report